

INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

REC'D 08 JUN 2004

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Applicant's or agent's file reference ANP/P017807WO	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB 03/01065	International filing date (day/month/year) 13.03.2003	Priority date (day/month/year) 13.03.2002
International Patent Classification (IPC) or both national classification and IPC F16K31/08		
Applicant BRITISH NUCLEAR FUELS PLC et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

 These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:
 - I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

Date of submission of the demand 03.10.2003	Date of completion of this report 07.06.2004
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Hatzenbichler, C Telephone No. +49 89 2399-8912 

**INTERNATIONAL PRELIMINARY
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International application No. PCT/GB 03/01065

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-12 as originally filed

Claims, Numbers

1-21 received on 29.03.2004 with letter of 19.03.2004

Drawings, Sheets

1/5-5/5 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	2,4,8-16,19-21
	No: Claims	1,3,5-7,17,18
Inventive step (IS)	Yes: Claims	11-16,19
	No: Claims	2,4,8-10,20,21
Industrial applicability (IA)	Yes: Claims	1-21
	No: Claims	

2. Citations and explanations

see separate sheet

1. From document GB-A-1 351 196 (D1) is known (see e.g. figure 1 and the corresponding description on page 2) a magnetic valve including a collar surrounding and defining a port and a plug 5 movable from a first position within the port, in which the port is wholly closed by the plug to a second position out of the port, in which the port is not wholly closed, and in which the plug and the collar are magnetically attracted such that in the first position the plug is magnetically retained within the port.

From figure 1 of D1 can be further seen that the plug 5 has a frusto-conical extension 7 on its side facing the valve seat. Since such a shape is a specific form of a convex shape also the last feature of claim 1, viz. that a first side of the plug has a convex surface, applies to the valve of document D1.

Consequently, the subject-matter of claim 1 lacks novelty (Article 33(2) PCT).

2. The features of dependent claims 2-10 are either already known from document D1 and/or relate merely to well-known options and do not appear to contain matter, which goes beyond the technical knowledge of the person skilled in the art or which would indicate the use of inventive ability.
3. The valve mechanism as defined in claim 11, however, which mechanism includes a valve according to claim 1 in combination with a specific actuator to operate the valve, is neither known nor rendered obvious by the available prior art and therefore meets the requirements of Article 33(2) and (3) PCT.
4. Since claims 12-16 are dependent on claim 11 their subject-matter also meets the required criteria of novelty and inventive step.
5. In document D1 is already expresses verbis mentioned that the valve disclosed therein is used for containers (see column 1, lines 10-11) and thus the subject-matter of claims 17 and 18 does not meet the requirement of novelty as set out in Article 33(2) PCT.
6. Since the valve mechanism as defined in any of claims 11-15 is regarded as novel and inventive, this also applies to a container having such a valve mechanism, as is defined in claim 19.

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7. The method of operating a magnetic valve as defined in claim 20 is not regarded as inventive in view of document D1.
8. To use a container as known from document D1 when carrying out the well-known method-steps defined in claim 21 does not involve an inventive activity and therefore the claimed method according to claim 21 likewise does not meet the requirement of Article 33(3) PCT.

CLAIMS:

1. A magnetic valve including a collar surrounding and defining a port and a plug movable from a first position within the port, in which the port is wholly closed by the plug, to a second position out of the port, in which the port is not wholly closed, and in which the plug and collar are magnetically attracted such that in the first position the plug is magnetically retained within the port, and wherein a first side of the plug has a convex shape.
2. A magnetic valve according to claim 1 which the first side of the plug has no flat surfaces perpendicular to the direction of material flow through the port.
3. A magnetic valve according to claim 1 or claim 2 in which the first side of the plug is conical.
4. A magnetic valve according to claim 3 in which the conical plug is hollow.
5. A valve as claimed in any preceding claim, in which a magnetic field is generated by the plug.
6. A valve as claimed in any of claims 1 to 4, in which a magnetic field is generated by the collar.
7. A valve as claimed in any preceding claim, in which a permanent magnet is the source of the magnetic field.
8. A valve as claimed in claim 7, in which the collar includes a plurality of permanent magnets disposed around the port.
9. A valve as claimed in any preceding claim, and including a limiter depending away from the collar which can engage the plug to limit the travel of the plug away from the collar in a first direction.

10. A valve as claimed in any preceding claim, and including a stop which prevents the plug being moved from the first position in a second direction.

5 11. A valve mechanism including a valve and an actuator to operate the valve, the valve being a magnetic valve including a collar surrounding and defining a port and a plug movable from a first position within the port, in which the port is wholly closed by the plug, to a second position out of the port, in which the port is not wholly closed, and in which the plug and collar are magnetically attracted such that in the first position the
10 plug is magnetically retained within the port, and wherein a first side of the plug has a convex shape, the actuator including a member which, when the member is driven in a first direction, engages a side of the plug to move the plug from the first to the second position thereby opening the valve.

15 12. A valve mechanism as claimed in claim 11, in which the member and the plug are magnetically attracted, such that the plug is retained by the member when in the second position.

13. A valve mechanism as claimed in claim 11 or claim 12, in which a second side
20 of the member opposite to the side which engages the plug has a convex shape.

14. A valve mechanism as claimed in claim 13 in which the second side has no flat surfaces perpendicular to the direction of flow of material through the port.

25 15. A valve mechanism as claimed in claim 13 or claim 14 in which the second side is conical.

16. A valve mechanism as claimed in any of claims 13 to 15 in which the second side of the actuator and the first side of the plug define a smooth outer surface.

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17. A container having a valve, the valve being a magnetic valve including a collar surrounding and defining a port and a plug movable from a first position within the port,

in which the port is wholly closed by the plug, to a second position out of the port, in which the port is not wholly closed, and in which the plug and collar are magnetically attracted such that in the first position the plug is magnetically retained within the port, and wherein a first side of the plug has a convex shape.

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18. A container according to claim 17 and having a valve according to any of claims 2 to 10.

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19 A container according to claim 17 and having a valve mechanism according to any of claims 11 to 15.

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20. A method of operating a magnetic valve having a collar defining a port and a plug magnetically retained in the port, the method including the steps of engaging an actuator member with a first side of the plug and driving the plug in a first direction out of the port, wherein a first side of the plug has a convex shape so as to help prevent material accumulating on the first side of the plug.

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21. A method of handling a material using a container, the container having a valve, the valve being a magnetic valve including a collar surrounding and defining a port and a plug movable from a first position within the port, in which the port is wholly closed by the plug, to a second position out of the port, in which the port is not wholly closed, and in which the plug and collar are magnetically attracted such that in the first position the plug is magnetically retained within the port, and wherein a first side of the plug has a convex shape, the method including the steps of presenting the container oriented with the valve upwards to an actuator;

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opening the valve with the actuator;

transferring the material into the container;

closing the valve;

inverting the orientation of the container to present the valve downwards to an

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actuator;

and opening the valve with an actuator.